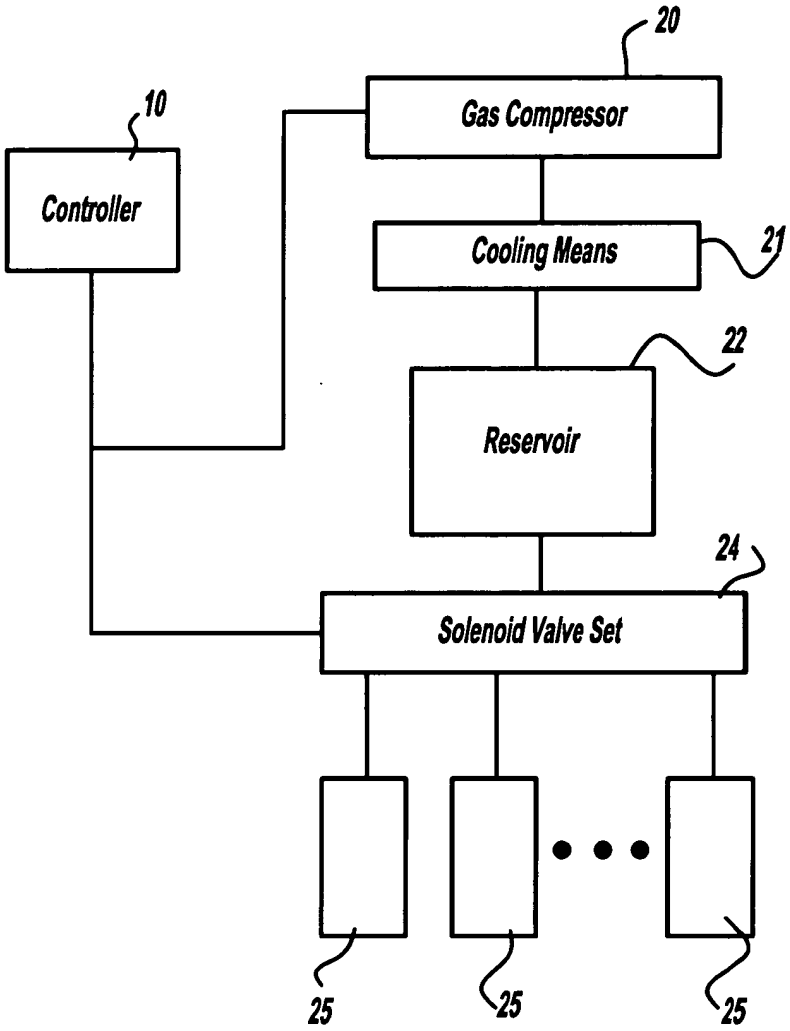

20
Gas Compressor
10
Controller
Cooling Means
21
22
Reservoir
24
Solenoid Valve Set
25
25
25

Figure - 1

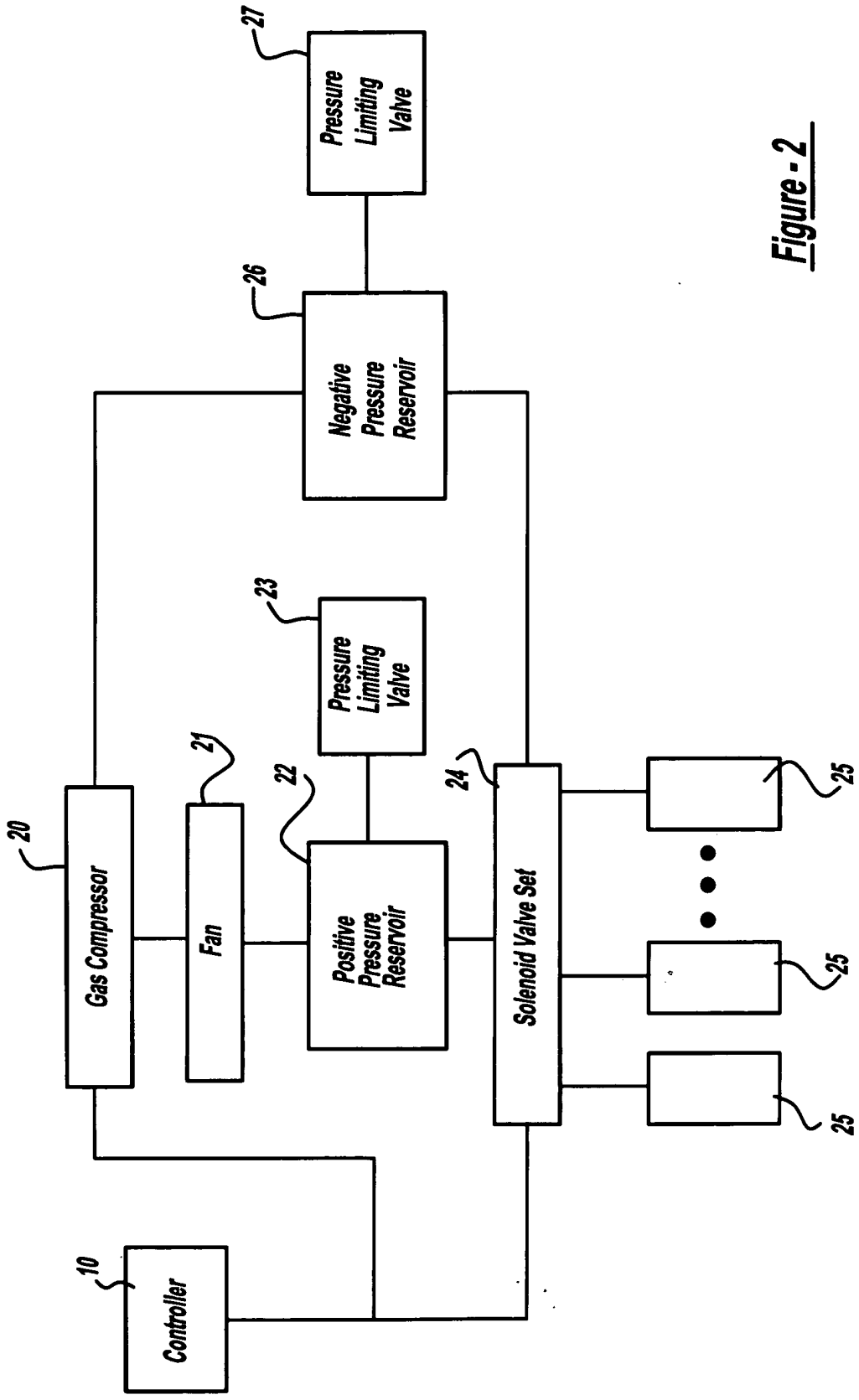

27
Pressure Limiting Valve
26
Negative Pressure Reservoir
23
Pressure Limiting Valve
21
22
24
25
20
Gas Compressor
Fan
Positive Pressure Reservoir
Solenoid Valve Set
25
25
10
Controller

Figure - 2

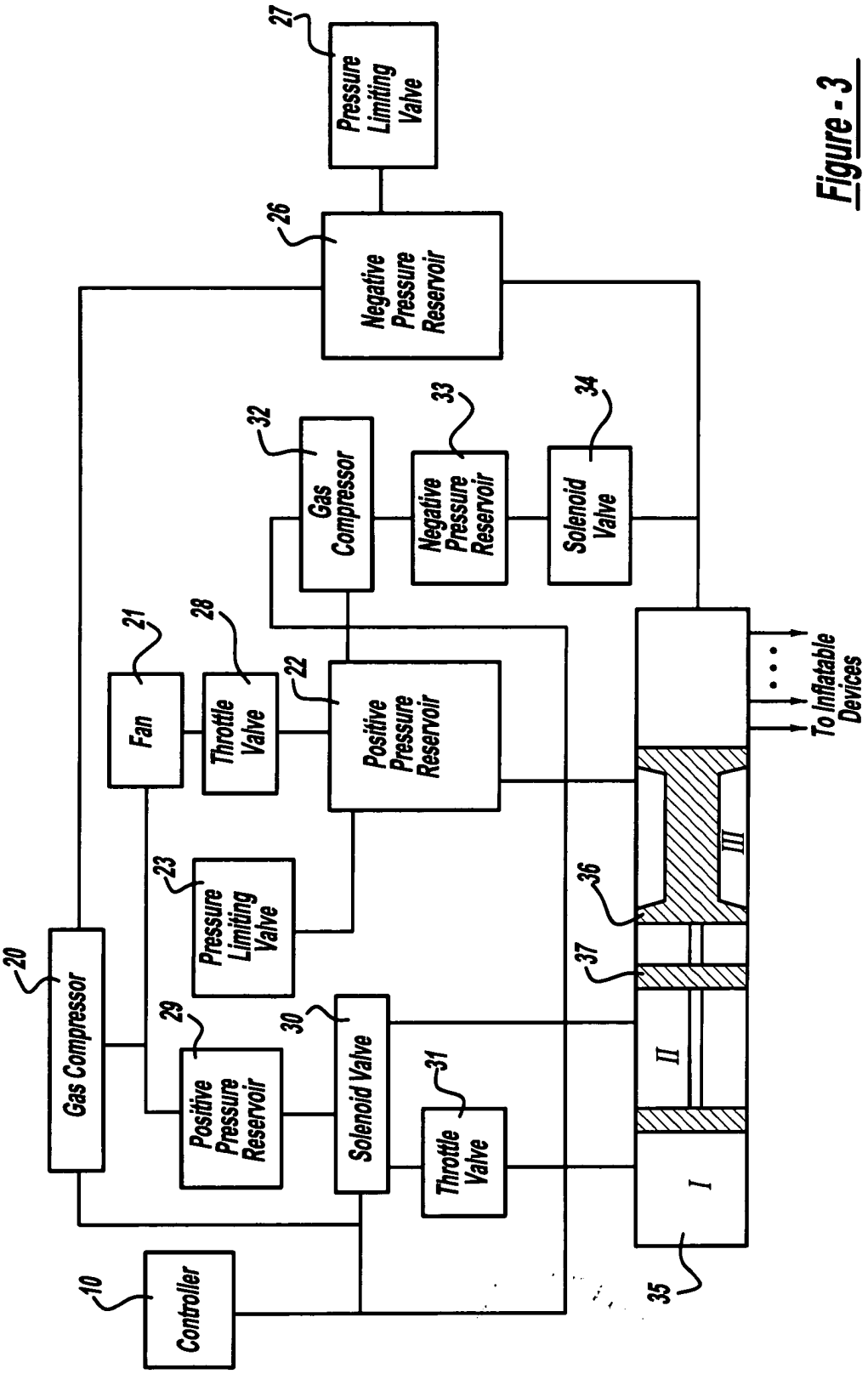

27
Pressure Limiting Valve
26
Negative Pressure Reservoir
32
Gas Compressor
33
Negative Pressure Reservoir
34
Solenoid Valve
21
Fan
28
Throttle Valve
22
Positive Pressure Reservoir
To Inflatable Devices
23
Pressure Limiting Valve
36
37
20
Gas Compressor
29
Positive Pressure Reservoir
30
Solenoid Valve
31
Throttle Valve
III
II
I
10
Controller
35

Figure - 3

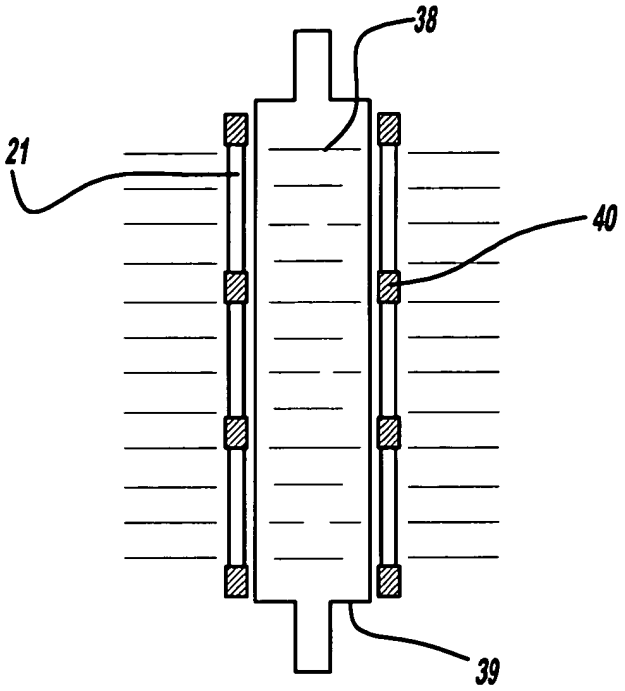


Figure - 4A

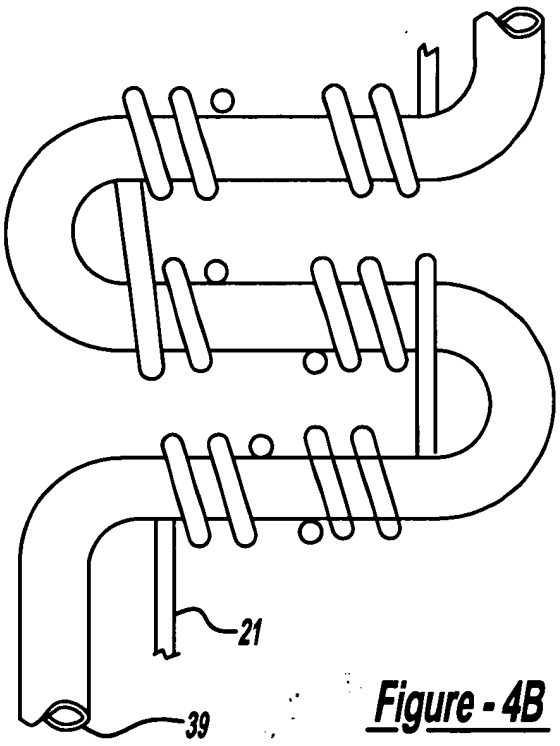


Figure - 4B

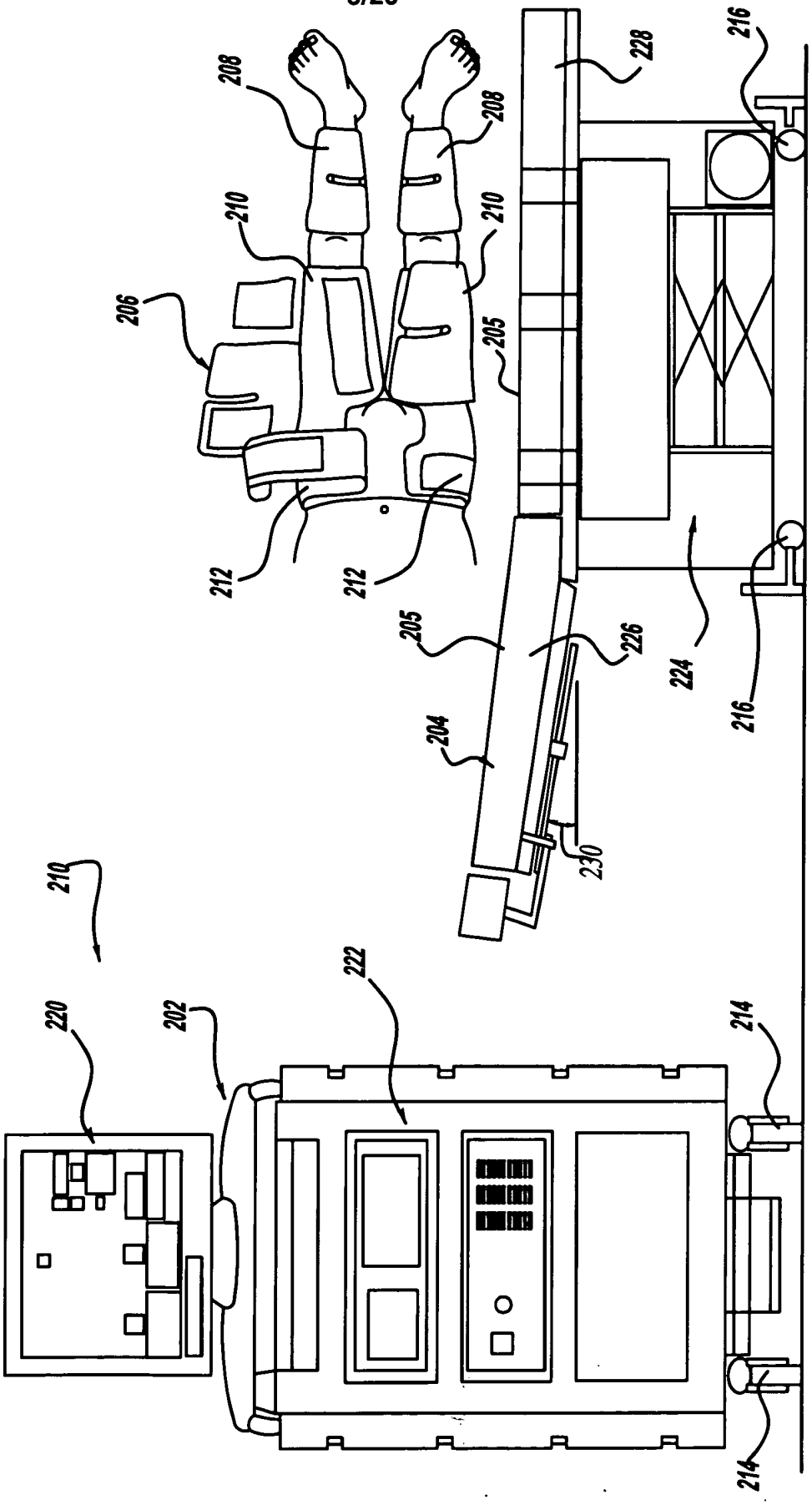

208
208
228
216
210
210
206
205
212
212
205
226
224
216
204
230
210
222
220
202
214
214

Figure - 5

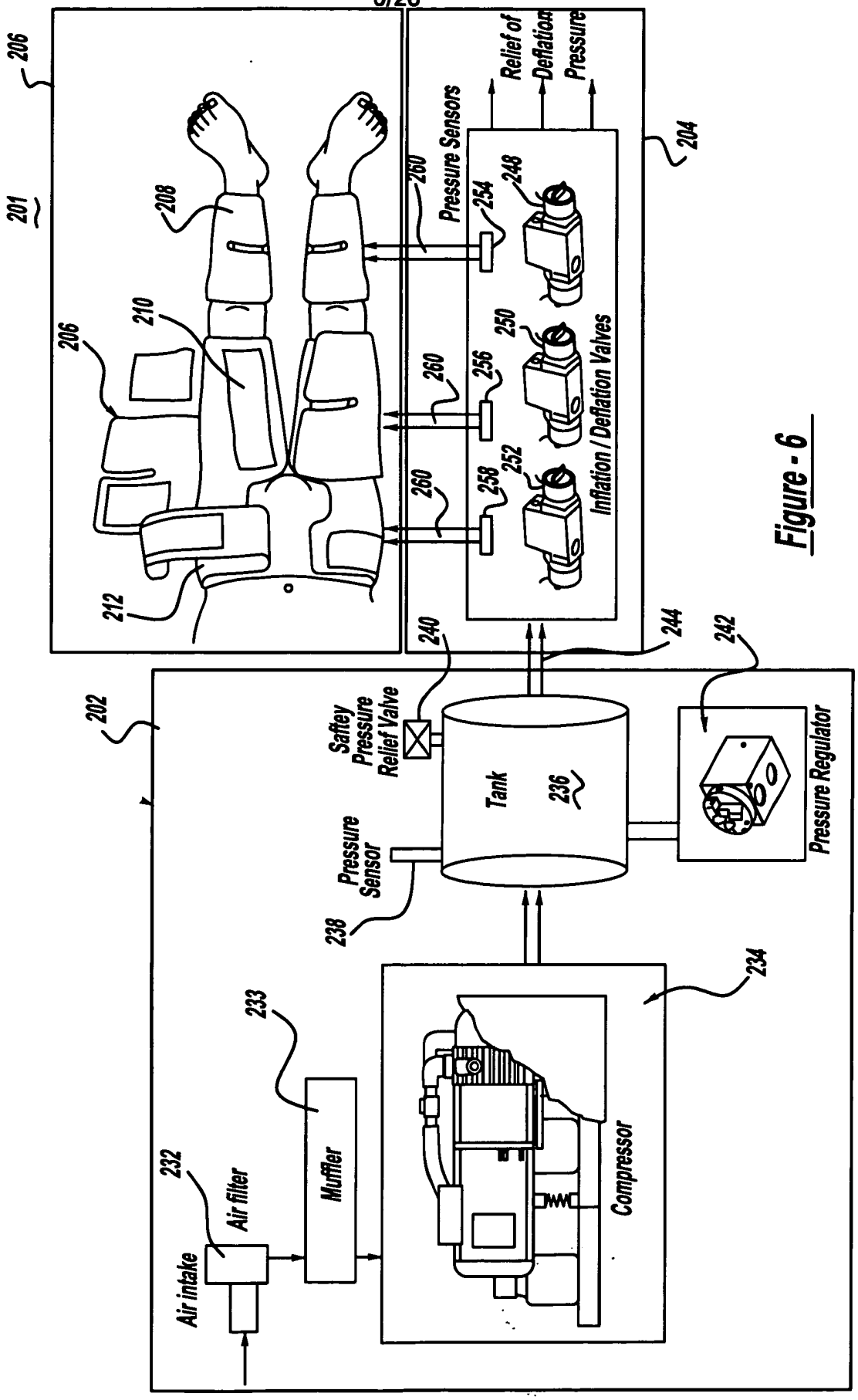

206
201
208
210
206
212
260
Pressure Sensors
254
248
250
256
260
252
258
260
Inflation / Deflation Valves
Relief of Deflation Pressure
204
240
244
242
202
Saftey Pressure Relief Valve
Tank
236
Pressure Regulator
Pressure Sensor
238
234
233
Muffler
232
Air filter
Air intake
Compressor

Figure - 6

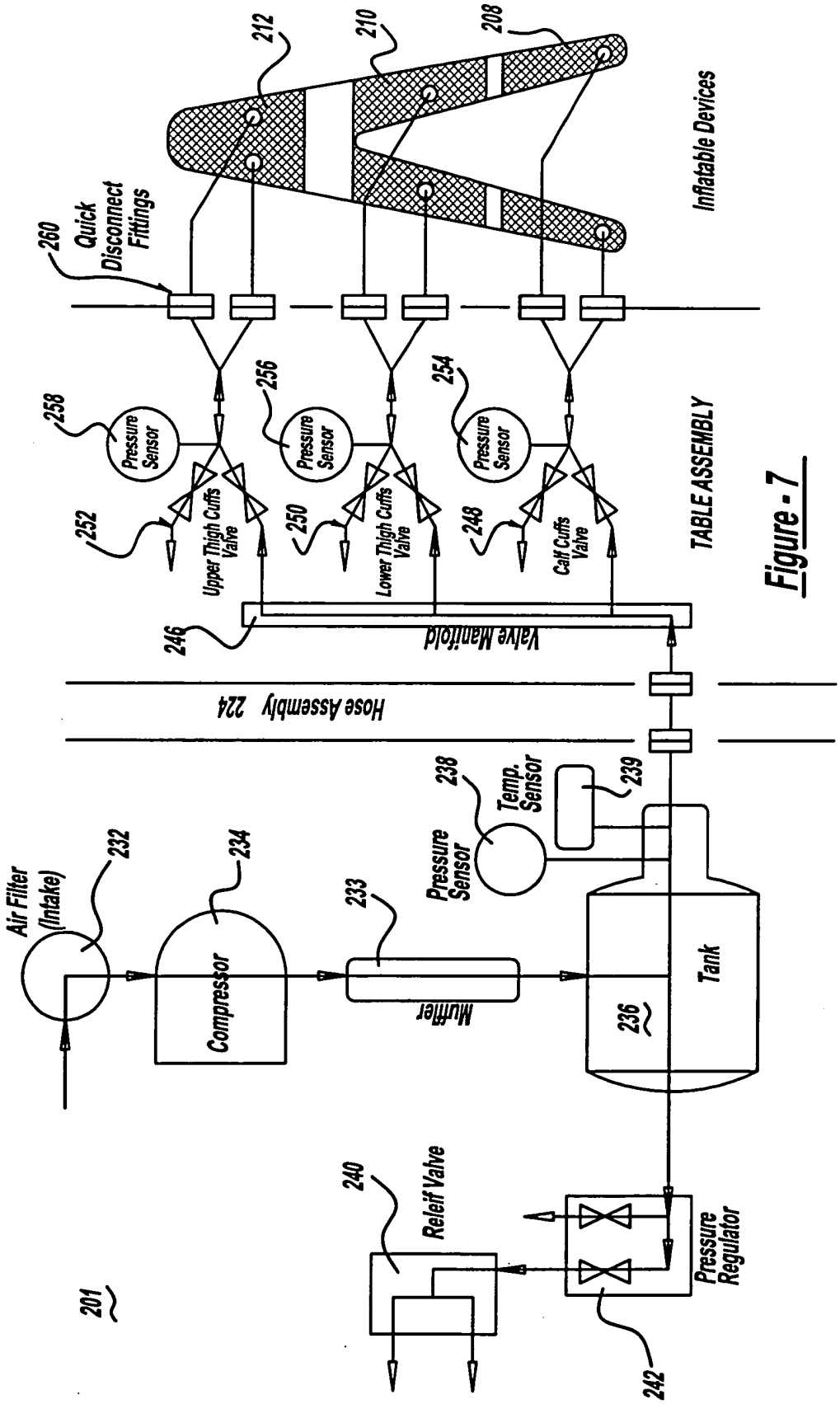

212
210
208
Inflatable Devices
260
Quick Disconnect Fittings
258
256
254
Pressure Sensor
Pressure Sensor
Pressure Sensor
252
250
248
Upper Thigh Cuffs Valve
Lower Thigh Cuffs Valve
Calf Cuffs Valve
TABLE ASSEMBLY
246
Valve Manifold
Hose Assembly 224
238
Temp. Sensor
239
Pressure Sensor
232
Air Filter (Intake)
234
Compressor
233
Muffler
236
Tank
240
Relief Valve
Pressure Regulator
201
242

Figure - 7

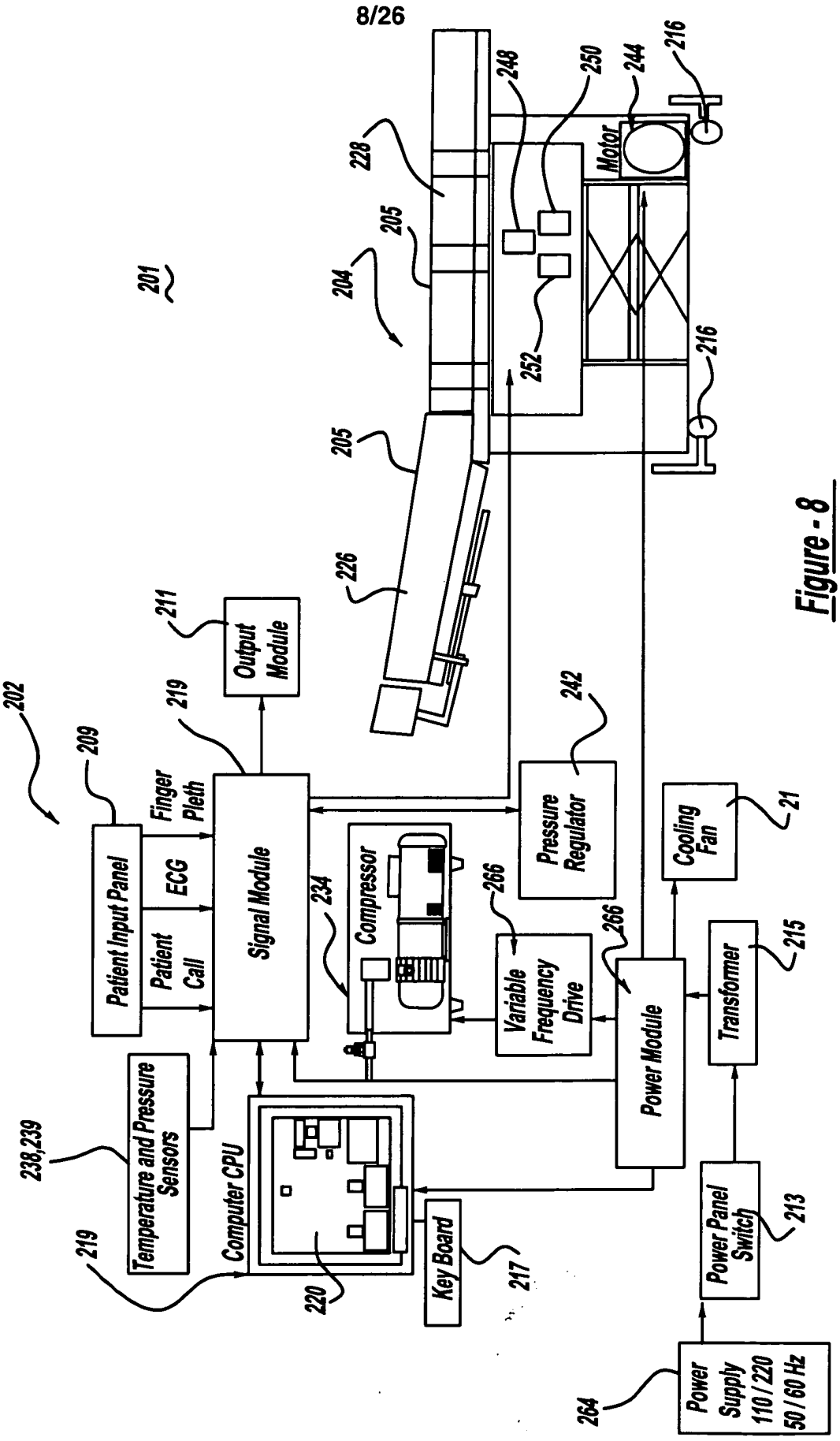

201
202
209
211
Output Module
219
Finger Pleth
ECG
Patient Call
Patient Input Panel
Signal Module
242
Pressure Regulator
Cooling Fan
21
234
Compressor
266
Variable Frequency Drive
266
Power Module
Transformer
215
238,239
Temperature and Pressure Sensors
Computer CPU
220
Key Board
217
Power Panel Switch
213
264
Power Supply 110/220 50/60 Hz
228
248
250
244
216
Motor
205
204
252
216
205
226

Figure - 8

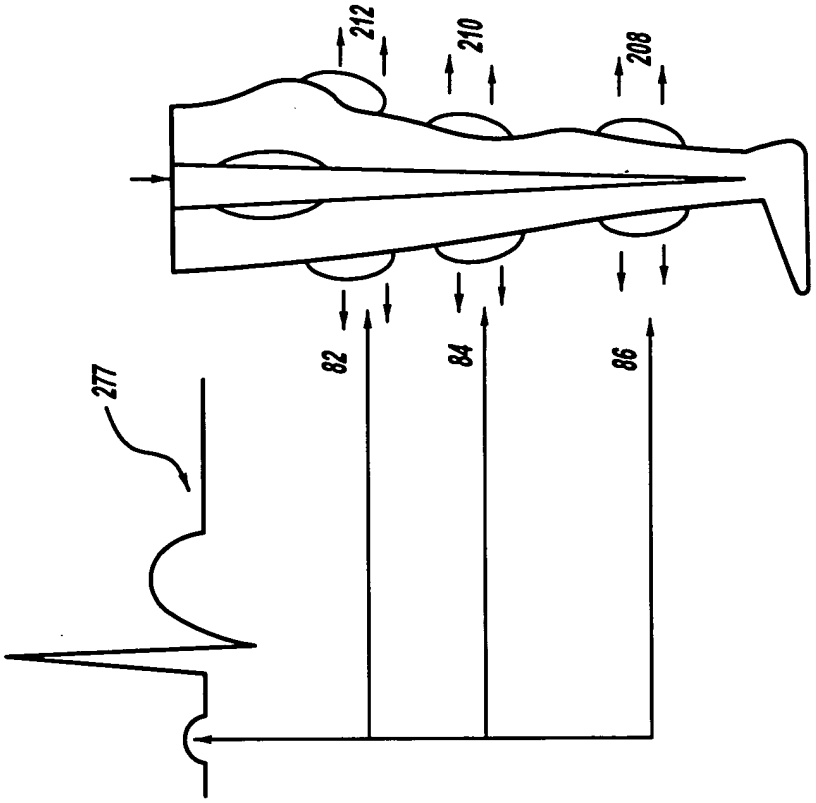


Figure - 9B

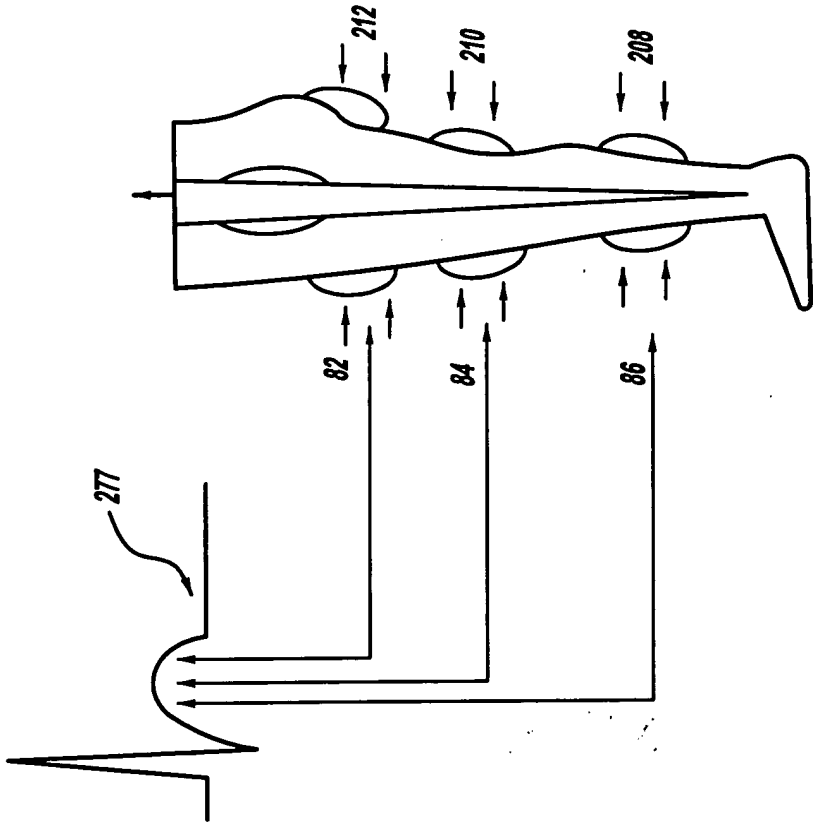


Figure - 9A

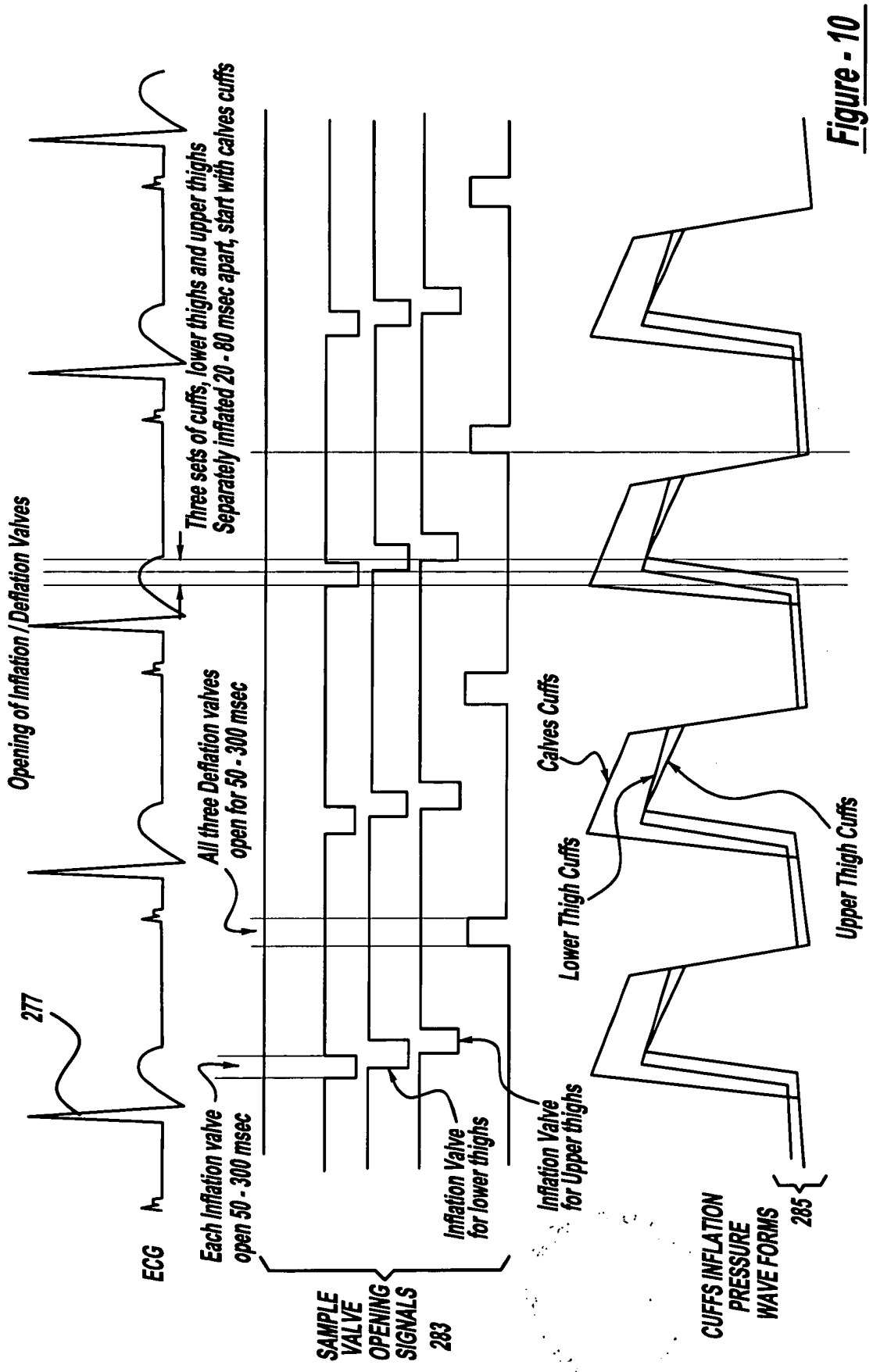

ECG
277
Each Inflation valve open 50 - 300 msec
Inflation Valve for lower thighs
Inflation Valve for Upper thighs
SAMPLE VALVE OPENING SIGNALS 283
All three Deflation valves open for 50 - 300 msec
Opening of Inflation / Deflation Valves
Three sets of cuffs, lower thighs and upper thighs Separately inflated 20 - 80 msec apart, start with calves cuffs
Calves Cuffs
Lower Thigh Cuffs
Upper Thigh Cuffs
CUFFS INFLATION PRESSURE WAVE FORMS 285

Figure - 10

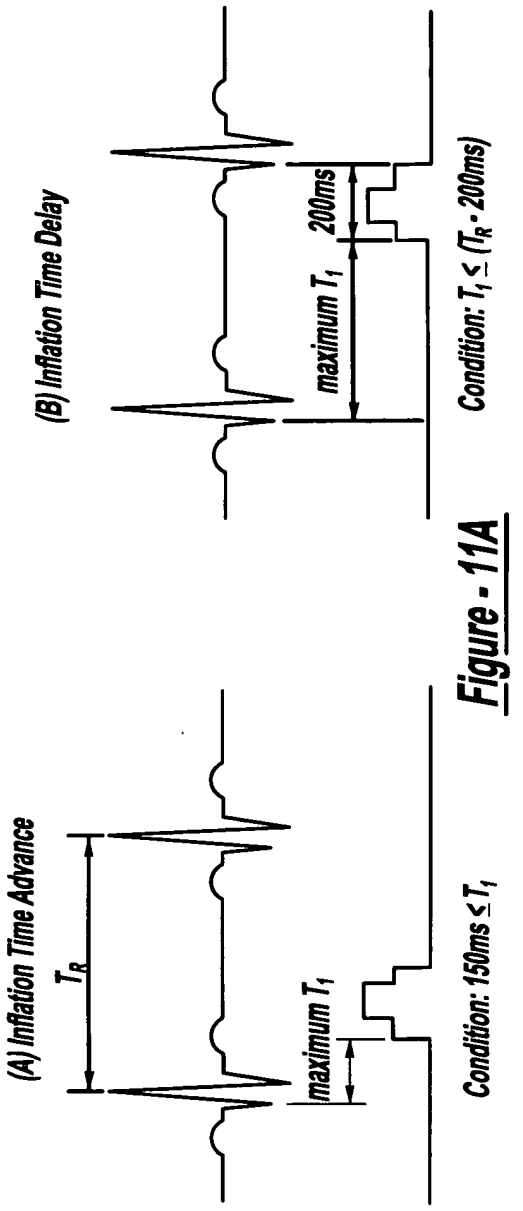


Figure - 11A

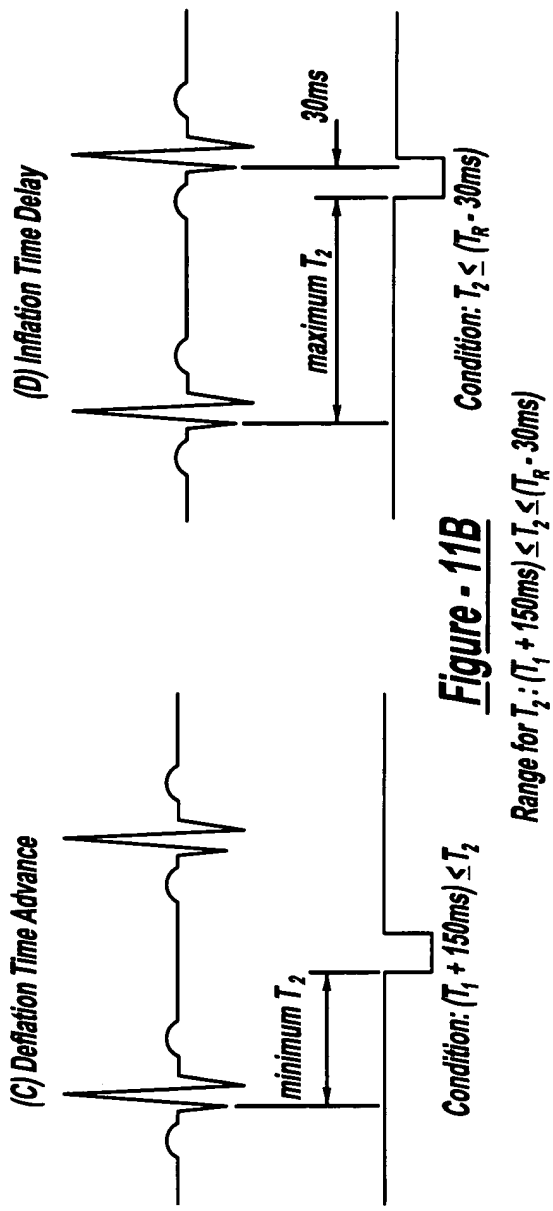


Figure - 11B

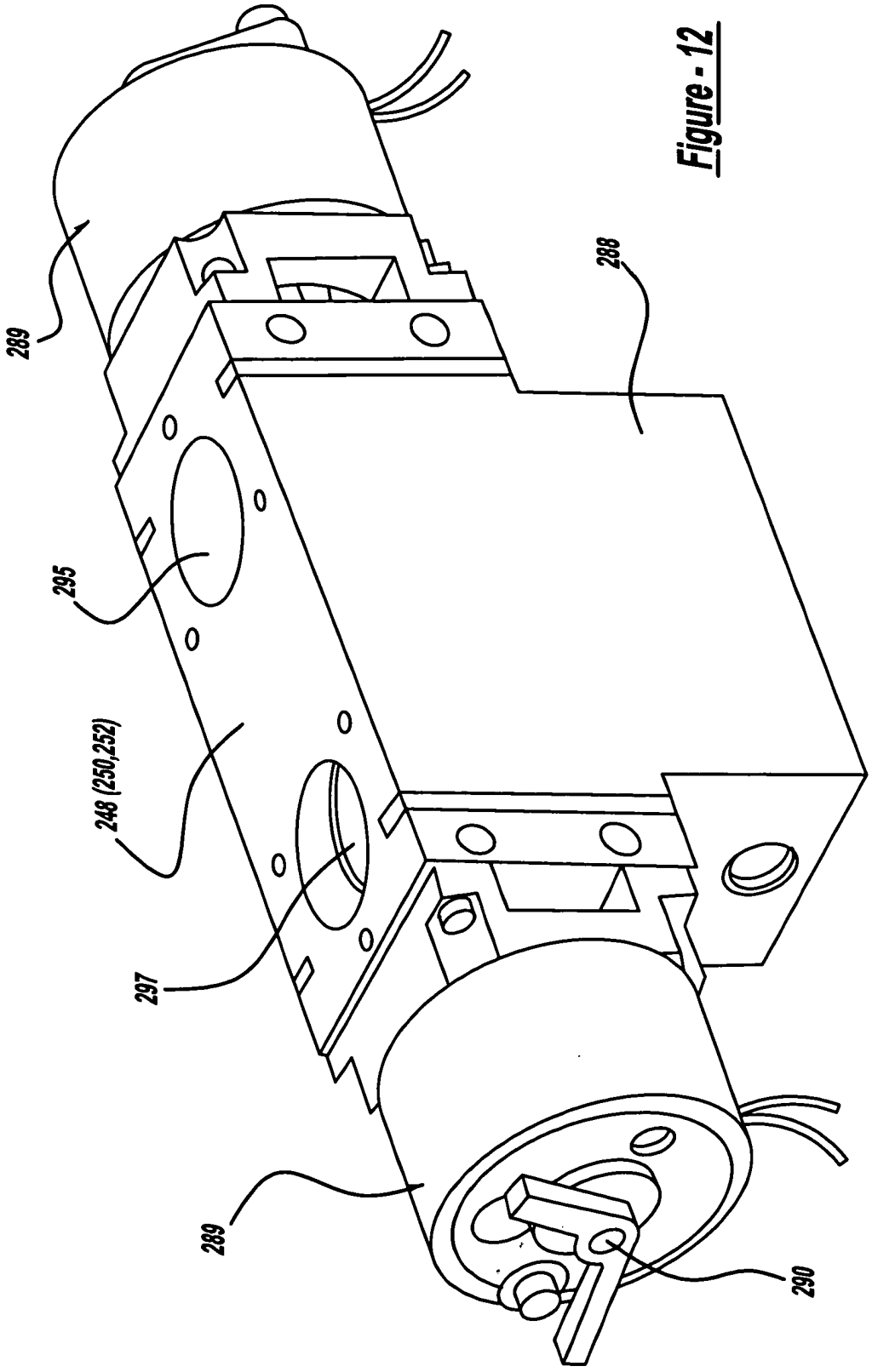


Figure - 12

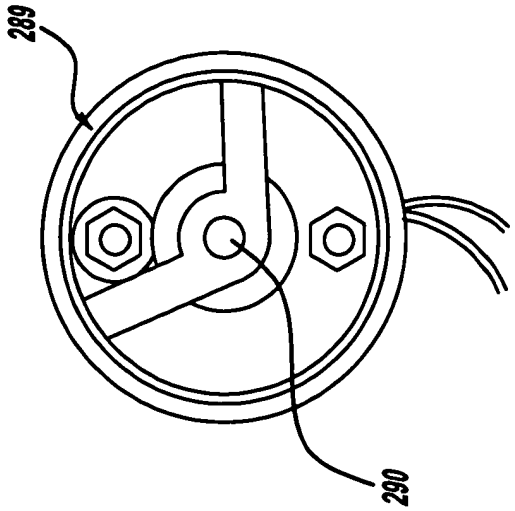


Figure - 15

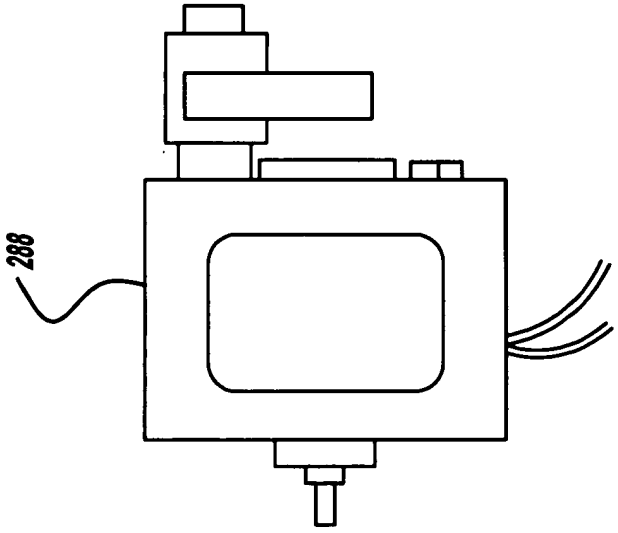


Figure - 13

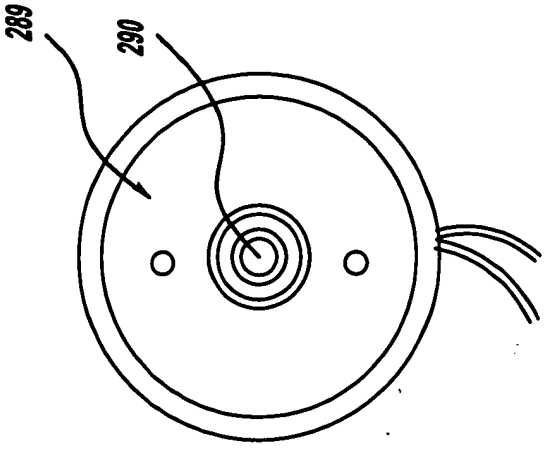


Figure - 14

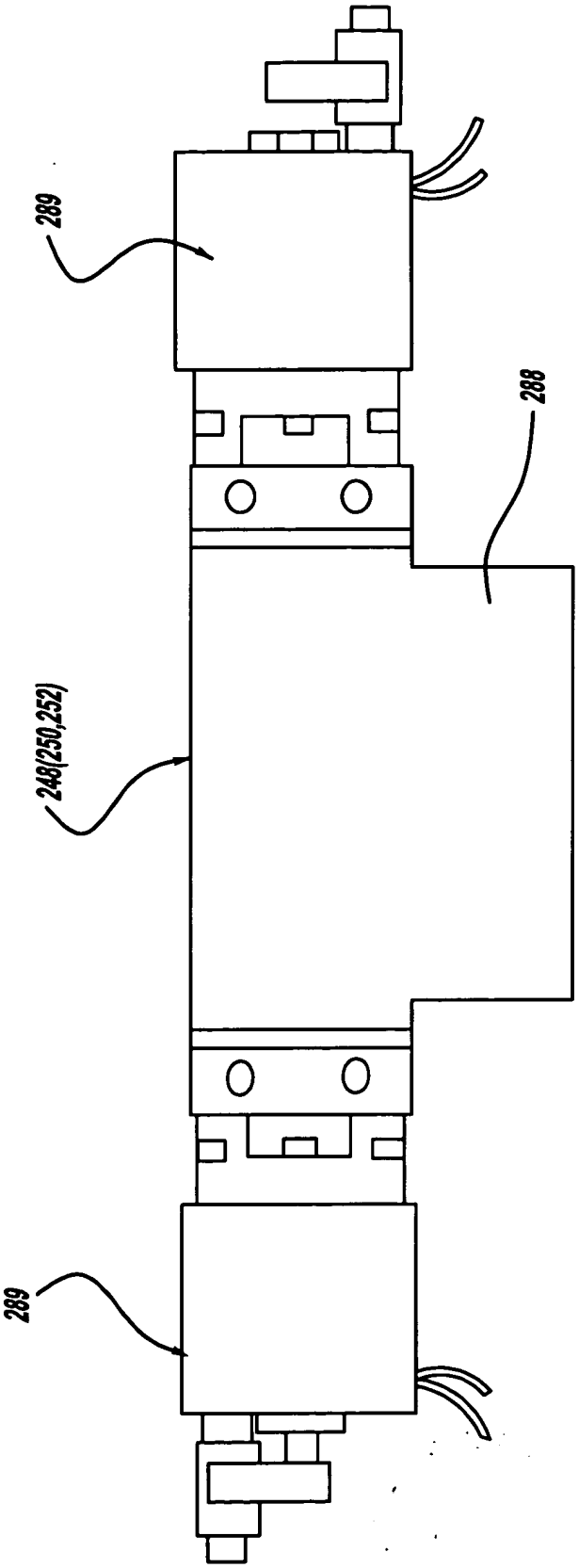


Figure - 16

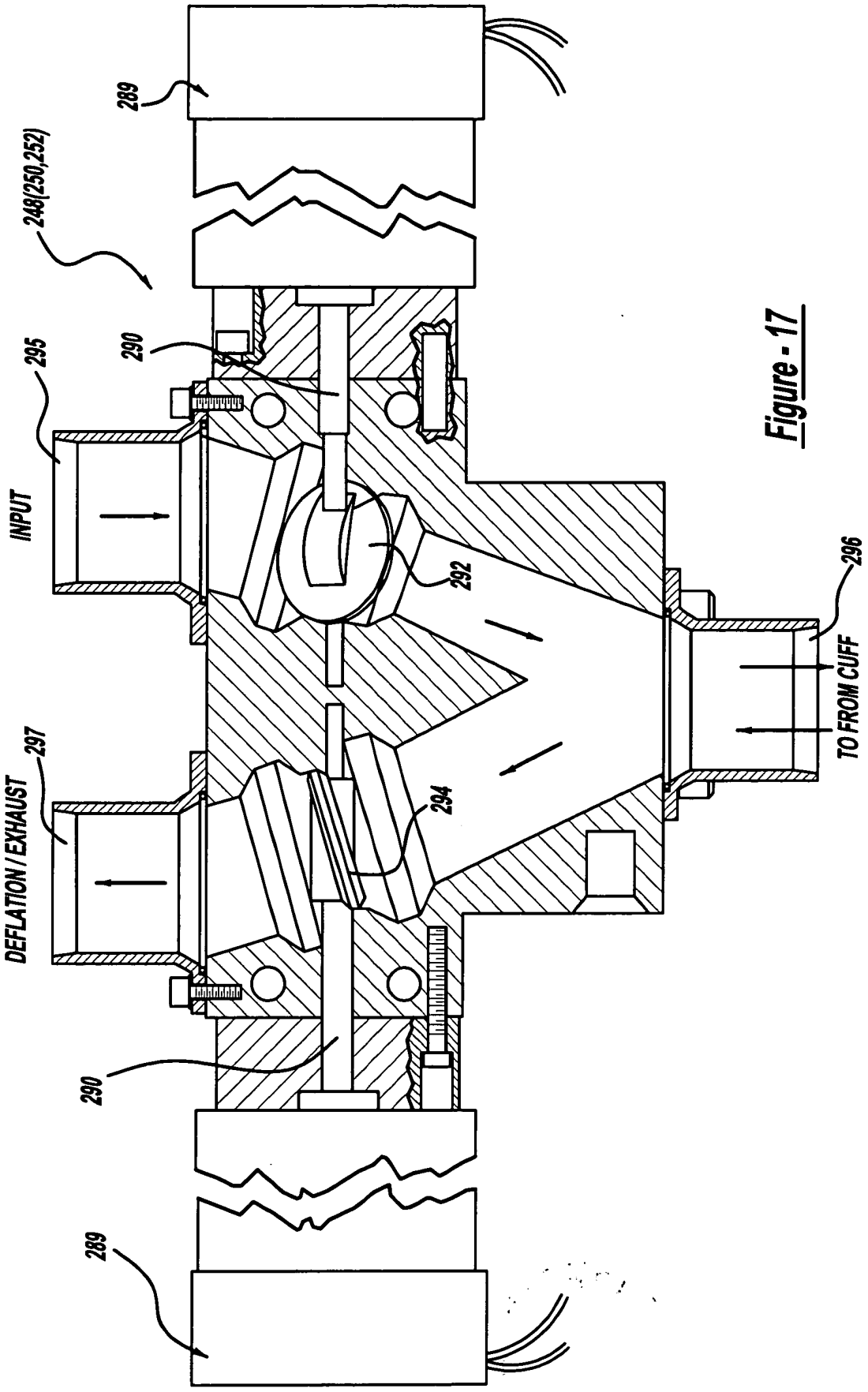

289
249(250,252)
290
295
INPUT
292
296
TO FROM CUFF
297
DEFLATION / EXHAUST
294
290
289

Figure - 17

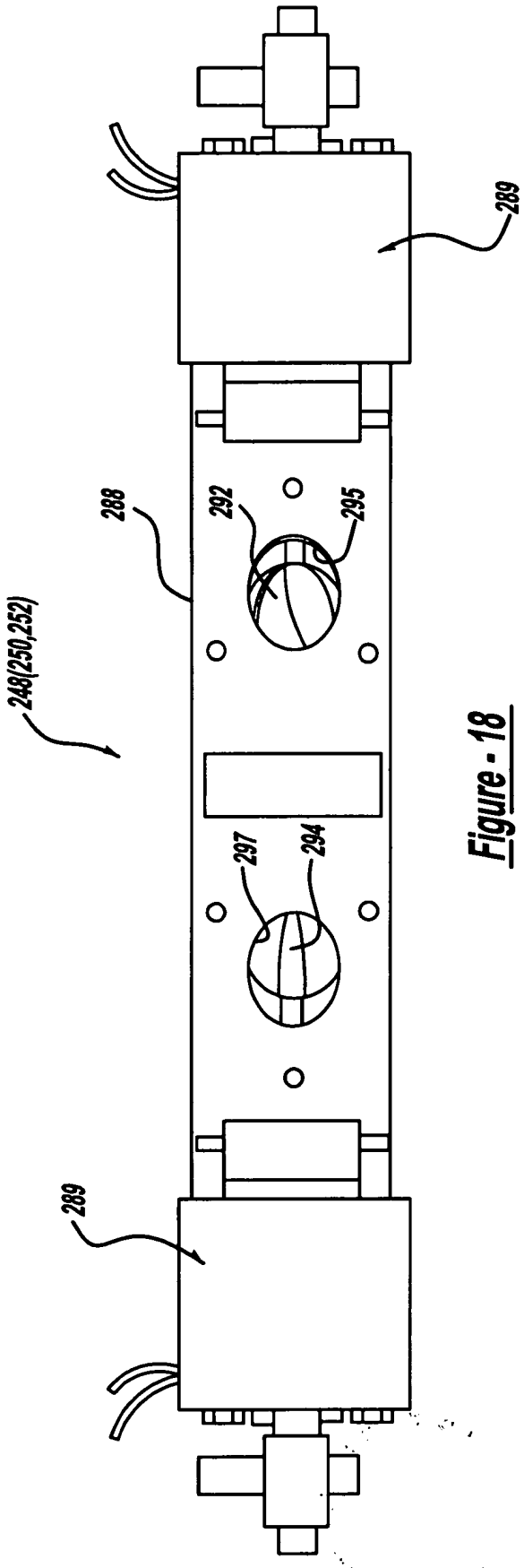
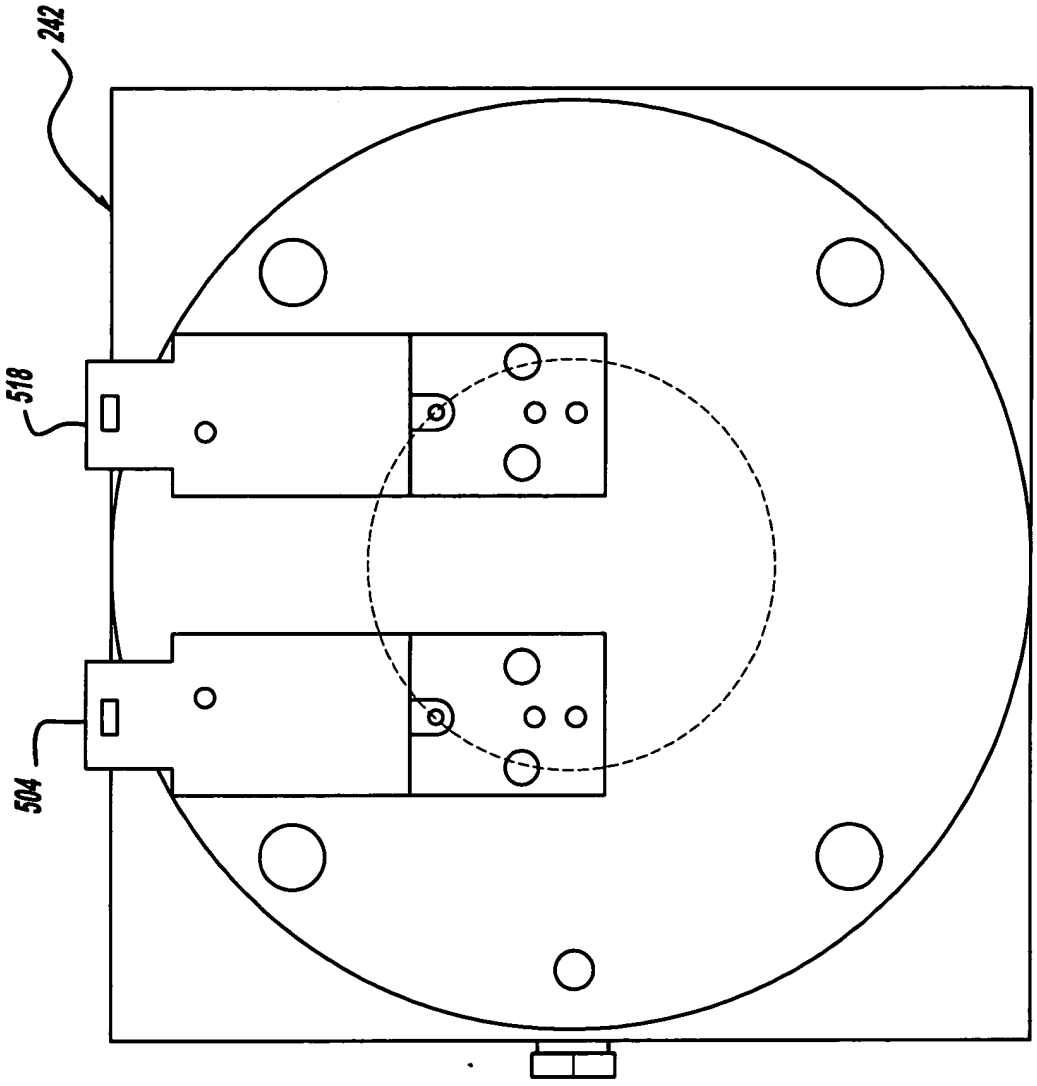


Figure - 18

Figure - 19



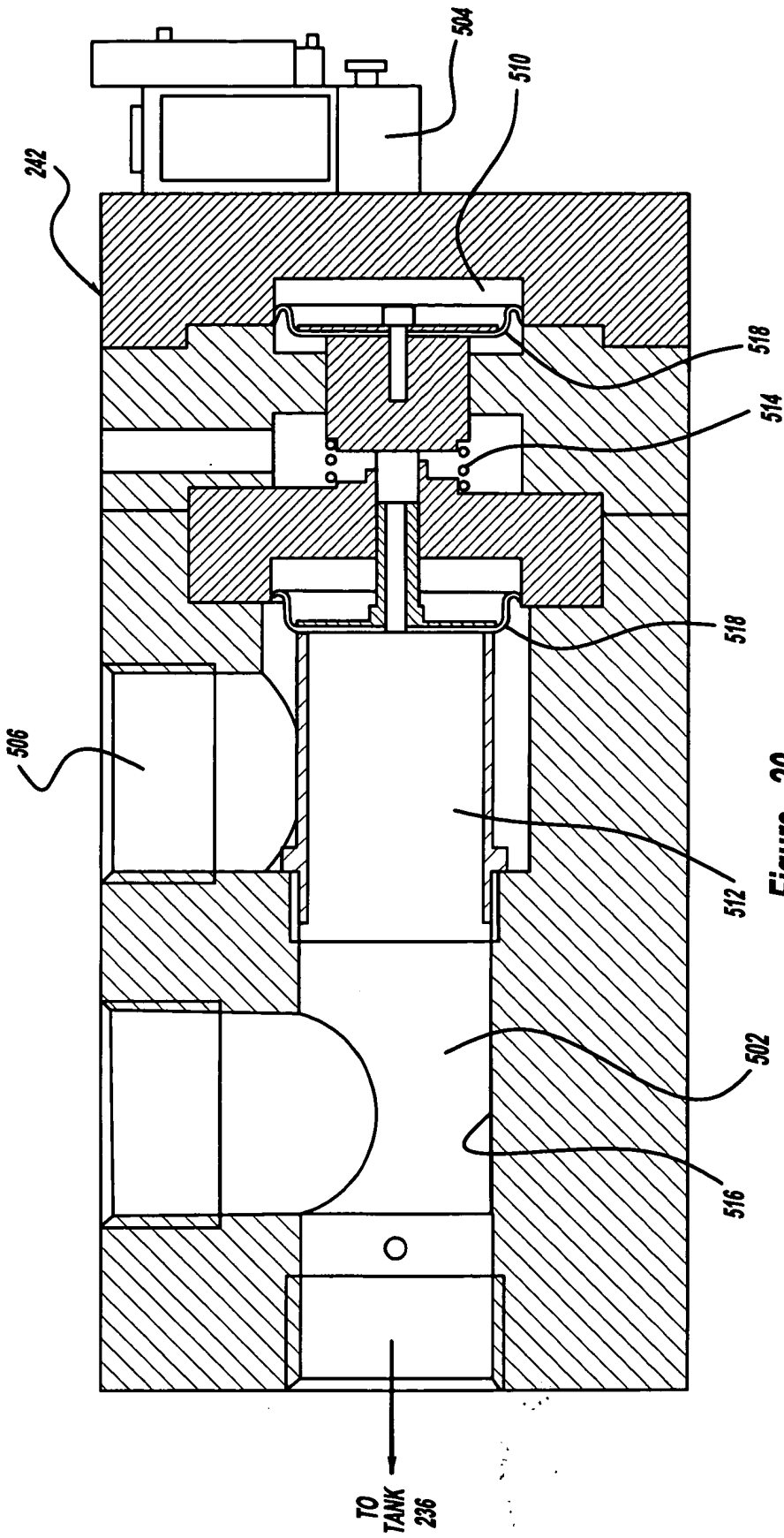


Figure - 20

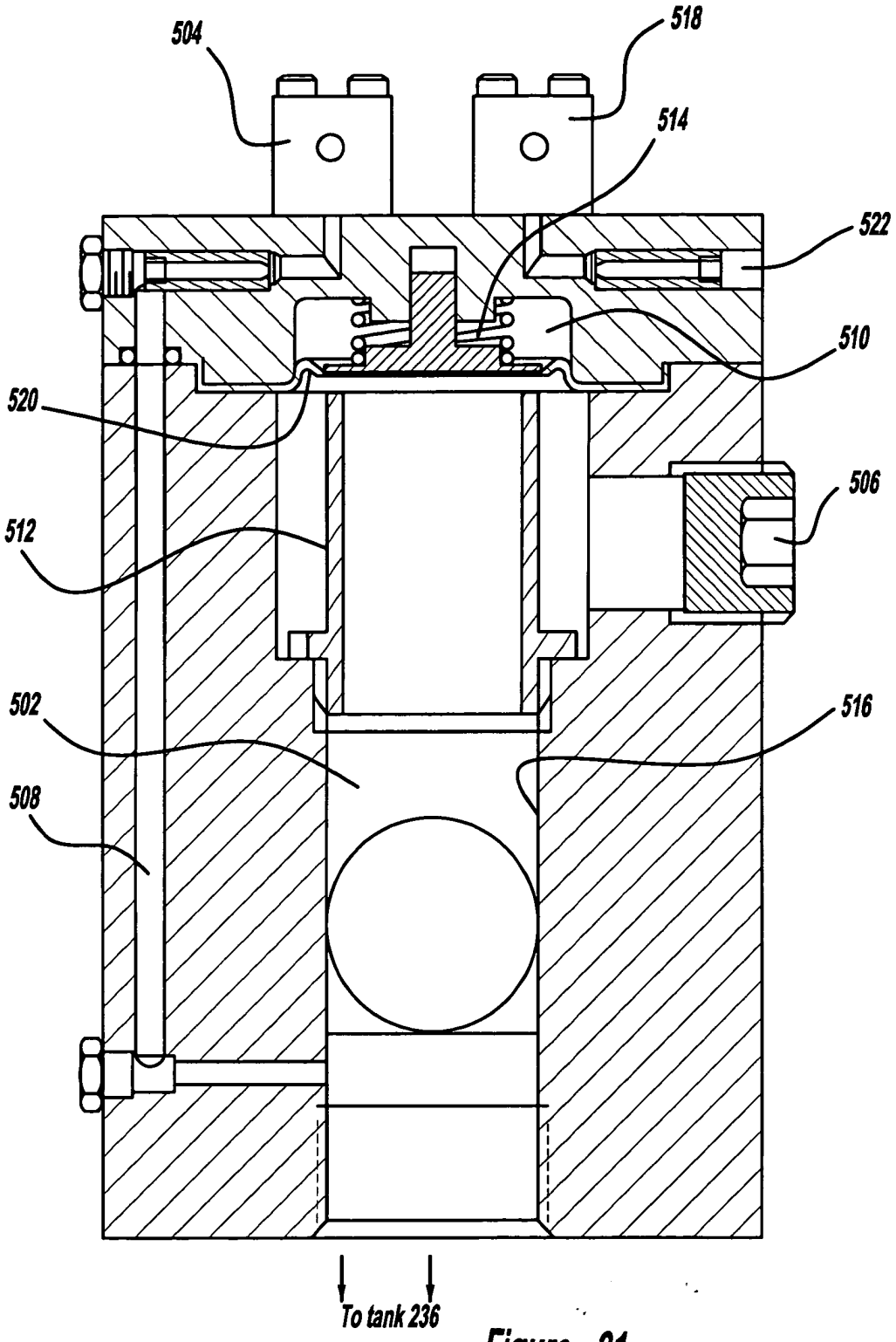


Figure - 21

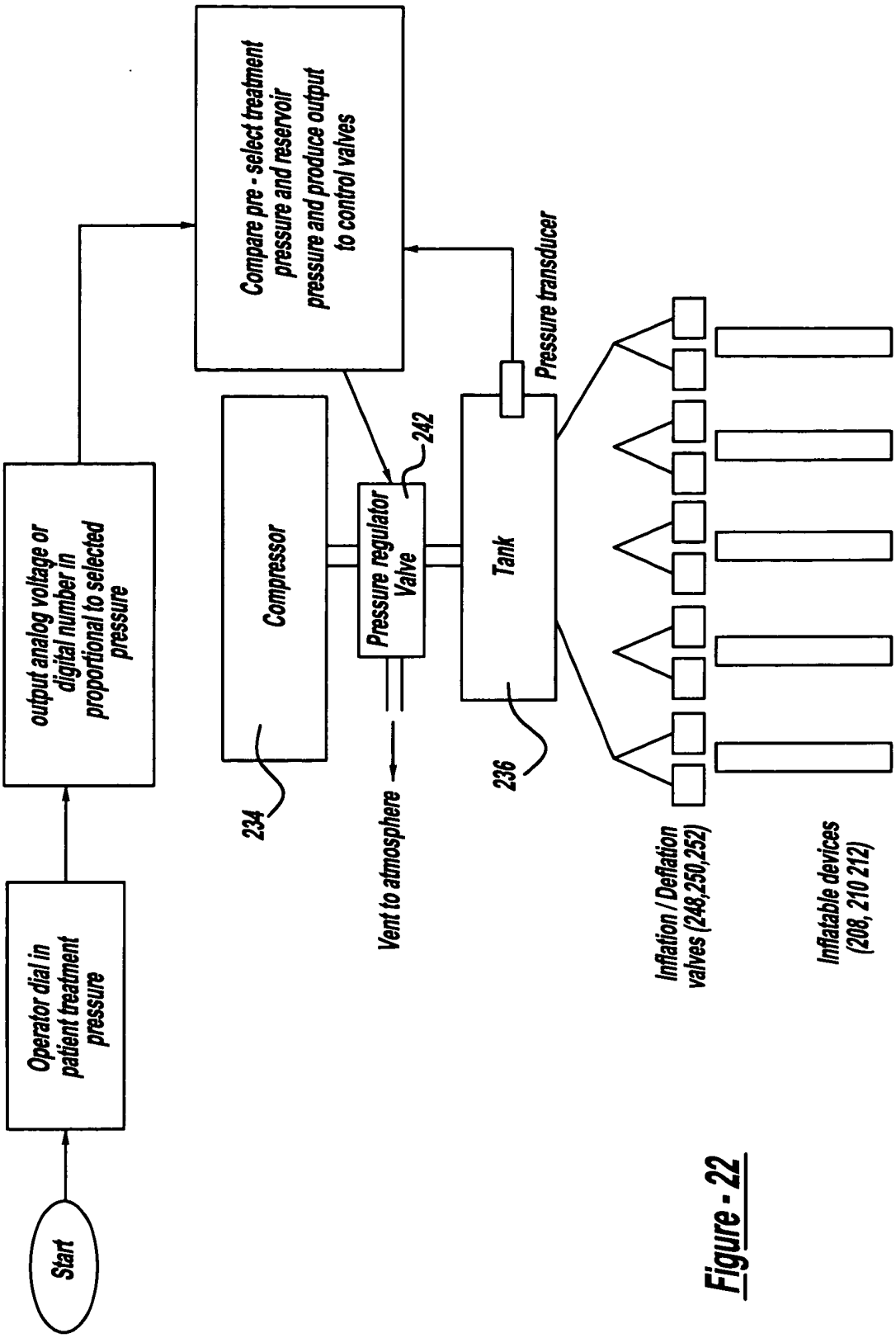

Start
Operator dial in patient treatment pressure
output analog voltage or digital number in proportional to selected pressure
Compare pre - select treatment pressure and reservoir pressure and produce output to control valves
Compressor
234
Pressure regulator Valve
242
Vent to atmosphere
Tank
236
Pressure transducer
Inflation / Deflation valves (248,250,252)
Inflatable devices (208, 210 212)

Figure - 22

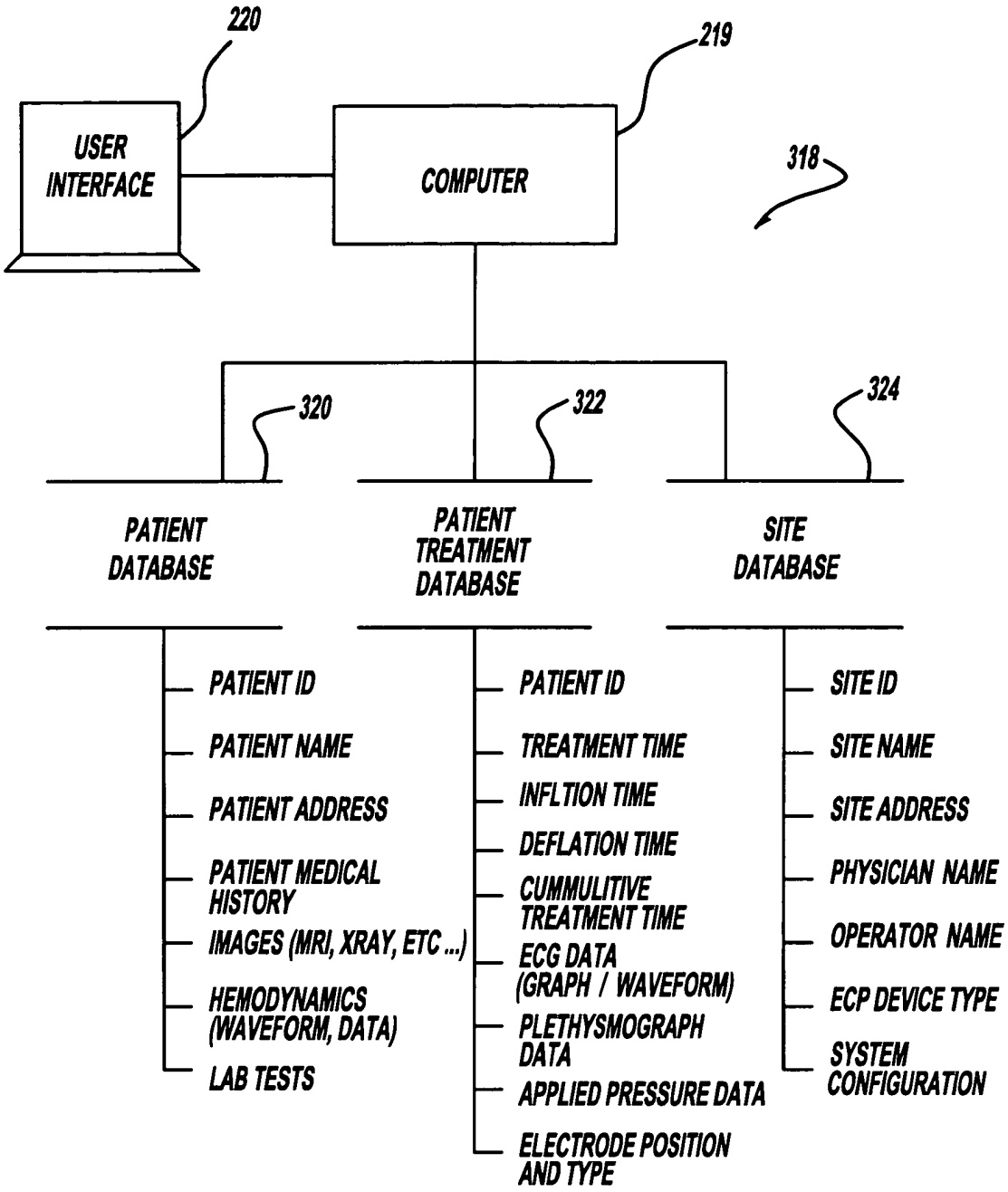

220
219
USER INTERFACE
COMPUTER
318
320
322
324
PATIENT DATABASE
PATIENT TREATMENT DATABASE
SITE DATABASE
PATIENT ID
PATIENT NAME
PATIENT ADDRESS
PATIENT MEDICAL HISTORY
IMAGES (MRI, XRAY, ETC ...)
HEMODYNAMICS (WAVEFORM, DATA)
LAB TESTS
PATIENT ID
TREATMENT TIME
INFLTION TIME
DEFLATION TIME
CUMMULITIVE TREATMENT TIME
ECG DATA (GRAPH / WAVEFORM)
PLETHYSMOGRAPH DATA
APPLIED PRESSURE DATA
ELECTRODE POSITION AND TYPE
SITE ID
SITE NAME
SITE ADDRESS
PHYSICIAN NAME
OPERATOR NAME
ECP DEVICE TYPE
SYSTEM CONFIGURATION

Figure - 23

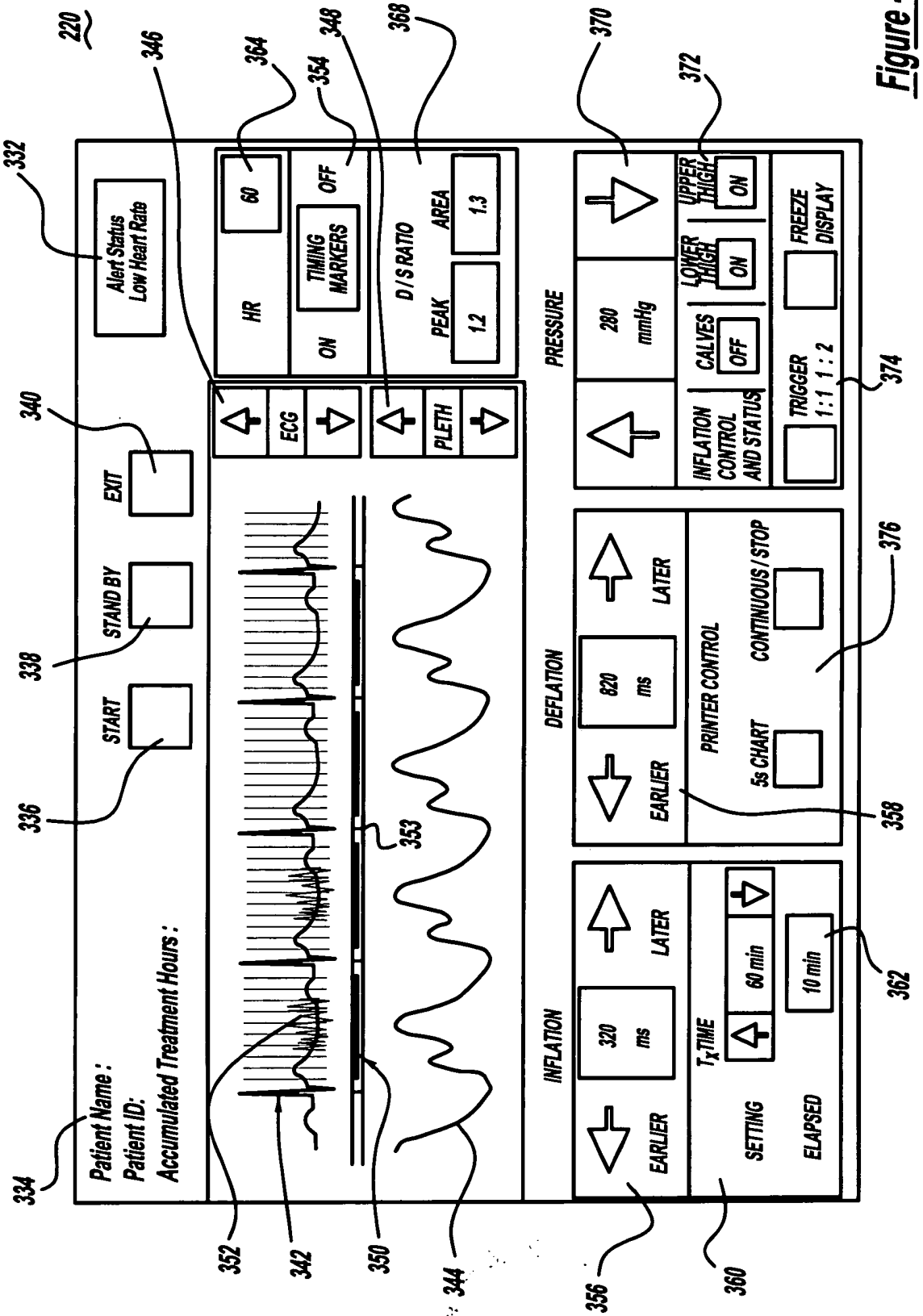

220
346
364
354
348
368
370
372
332
Alert Status
Low Heart Rate
HR
60
TIMING MARKERS
OFF
ON
D/S RATIO
AREA
1.3
PEAK
1.2
PRESSURE
280 mmHg
UPPER THIGH
ON
LOWER THIGH
ON
CALVES
OFF
FREEZE DISPLAY
INFLATION CONTROL AND STATUS
TRIGGER
1:1 1:2
374
340
EXIT
ECG
PLETH
338
STAND BY
DEFLATION
820 ms
LATER
EARLIER
376
START
PRINTER CONTROL
CONTINUOUS / STOP
5s CHART
336
353
358
INFLATION
320 ms
LATER
EARLIER
T_X TIME
60 min
10 min
SETTING
ELAPSED
362
Patient Name :
Patient ID:
Accumulated Treatment Hours :
334
352
342
350
344
356
360

Figure - 24

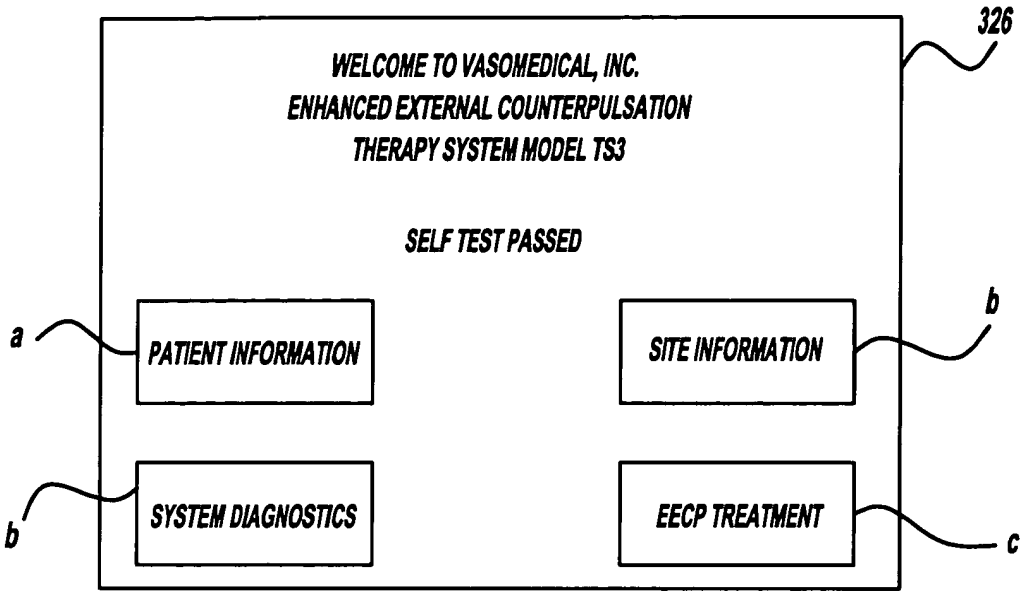


Figure - 25

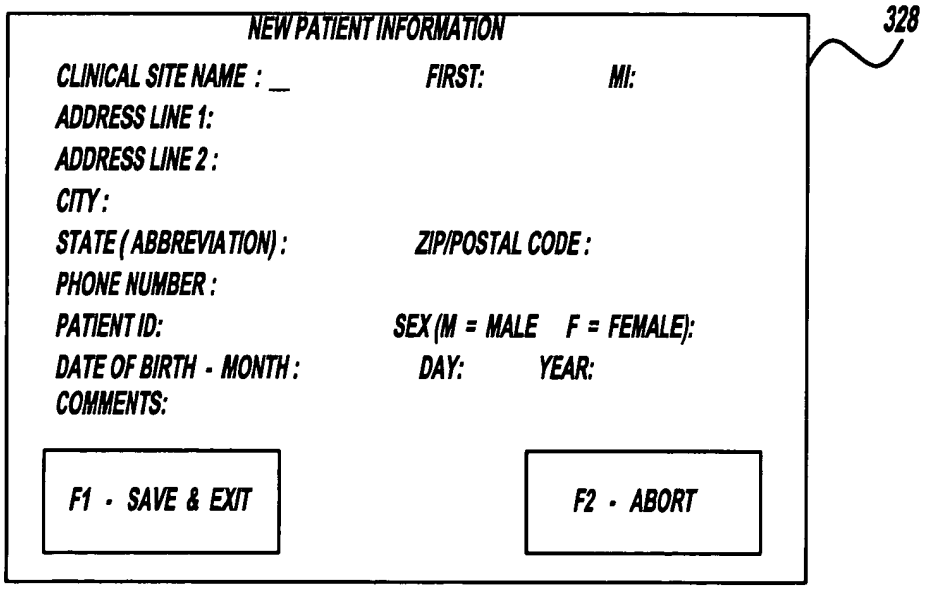


Figure - 26

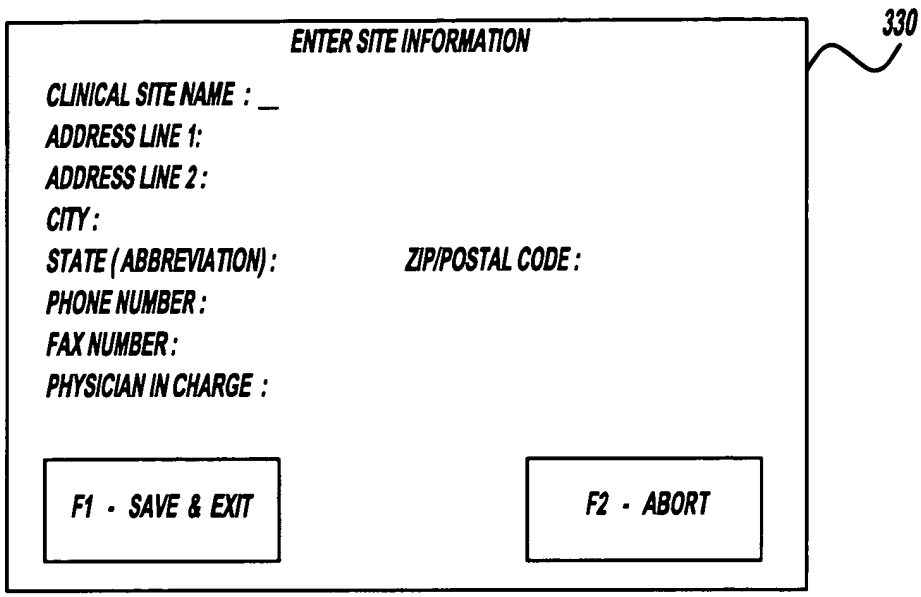

330
ENTER SITE INFORMATION
CLINICAL SITE NAME : _
ADDRESS LINE 1:
ADDRESS LINE 2 :
CITY :
STATE (ABBREVIATION) :
ZIP/POSTAL CODE :
PHONE NUMBER :
FAX NUMBER :
PHYSICIAN IN CHARGE :
F1 - SAVE & EXIT
F2 - ABORT

Figure - 27

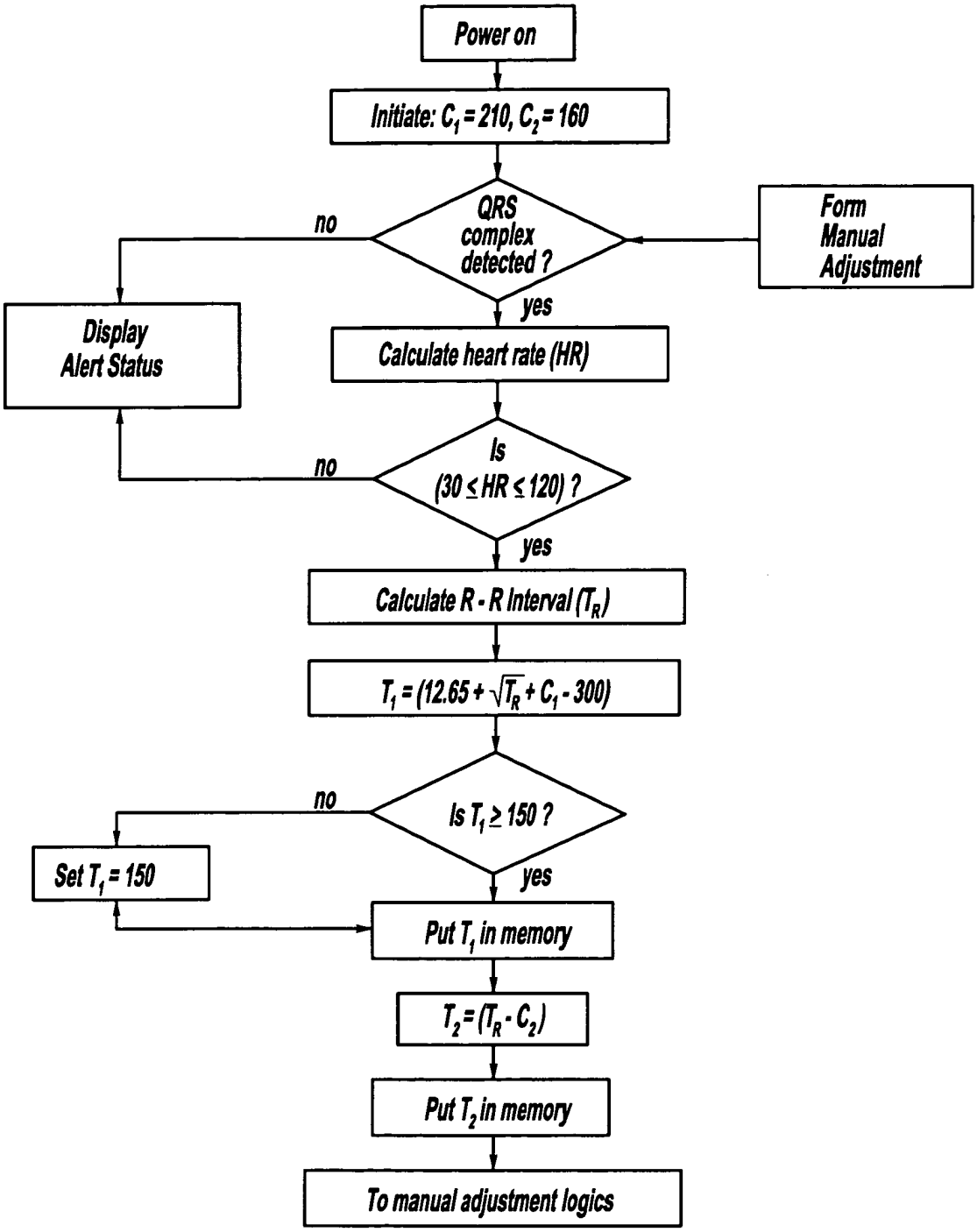

Power on
Initiate: $C_1 = 210$, $C_2 = 160$
QRS complex detected ?
no
yes
Form Manual Adjustment
Display Alert Status
Calculate heart rate (HR)
Is $(30 \leq HR \leq 120)$?
no
yes
Calculate R - R Interval (T_R)
$T_1 = (12.65 + \sqrt{T_R} + C_1 - 300)$
Is $T_1 \geq 150$?
no
yes
Set $T_1 = 150$
Put T_1 in memory
$T_2 = (T_R - C_2)$
Put T_2 in memory
To manual adjustment logics

Figure - 28

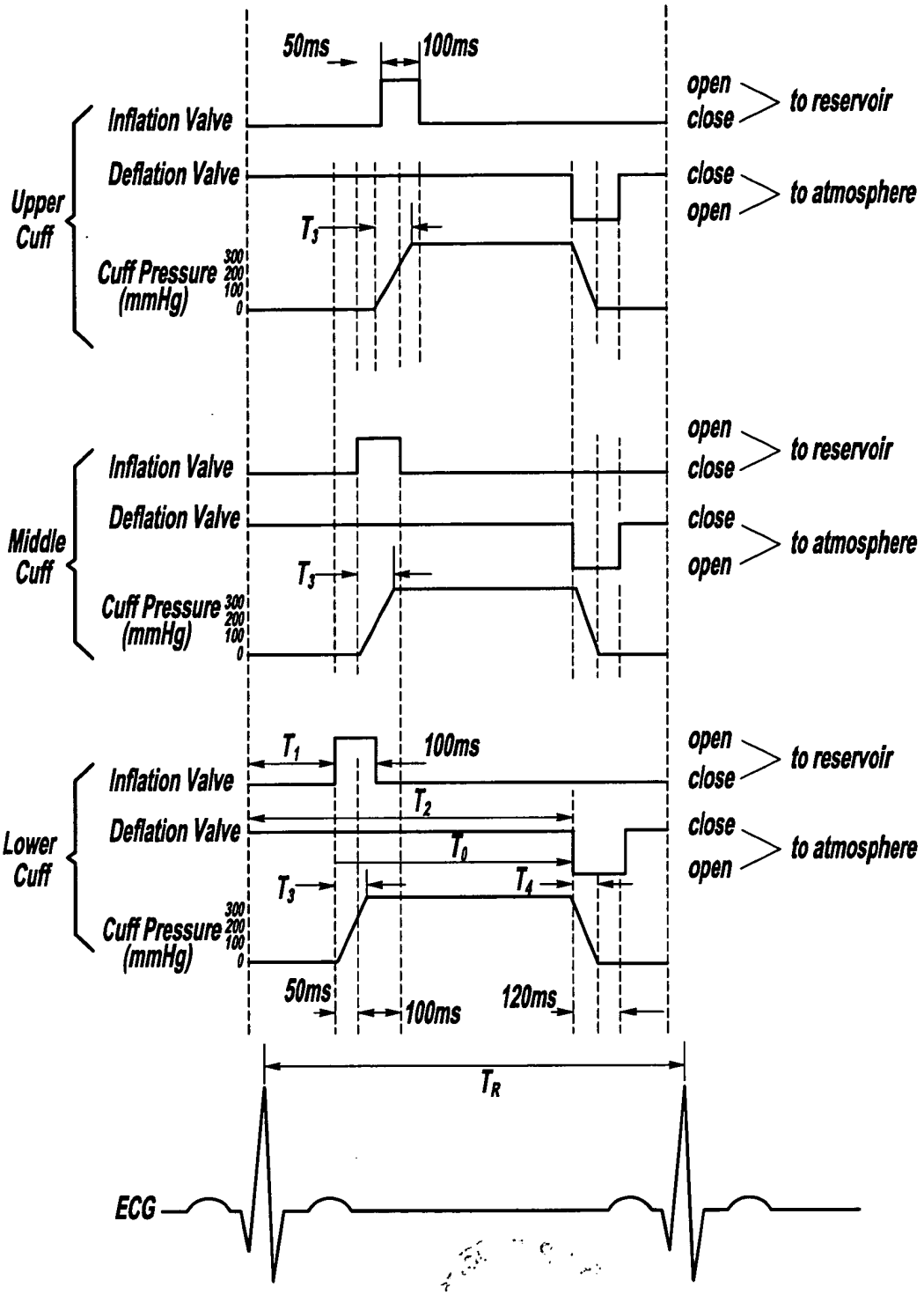

50ms
100ms
Inflation Valve
Deflation Valve
Upper Cuff
Cuff Pressure (mmHg)
300
200
100
0
T_3
open
close
to reservoir
close
open
to atmosphere
Middle Cuff
Lower Cuff
T_1
T_2
T_0
T_4
120ms
T_R
ECG

Figure - 29